WHAT IS CLAIMED IS:

1. A method for making transition metal-substituted cobalt ferrite comprising the steps of:

mixing oxides or carbonates of Fe, Co, and M in the targeted proportions to form a mixed powder, where M is selected from the group consisting of Mn, Cr, Zn, Al, Cu, and any mixtures thereof;

pressing the mixed powder;

calcining the mixed powder at a temperature in the range of approximately 900°C to 1200°C for a period of time ranging from about 2 to about 24 hours in air;

ball milling the mixed powder to less than 38 micron powder;

pressing and calcining the mixed powder at a temperature in the range of approximately 900°C to 1200°C for a period of time ranging from about 2 to about 24 hours in air;

remilling the mixed powder to less than 38 micron powder;

mixing the mixed powder and forming the mixed powder into a desired shape; and

sintering the mixed powder at a temperature in the range of approximately 1000°C to 1350°C for a period of time ranging from about 2 to about 24 hours in air, thereby forming the transition metal-substituted cobalt ferrite.

2. The method of claim 1 wherein the metal being substituted into the compound is manganese.

3. The method of claim 2 wherein the manganese substituted cobalt ferrite has a general formula $CoFe_{2-x}Mn_xO_4$ where x is about 0 to about 1.0.

4. The method of claim 2 wherein the manganese substituted cobalt ferrite has a general formula $Co_{1-y}Mn_yFe_2O_4$ where y is about 0 to about 0.95.

5. The method of claim 2 wherein the manganese substituted cobalt ferrite has an amplitude of magnetostriction of at least about 50 to about 250 ppm.

6. The method of claim 1 wherein the metal being substituted into the compound is a transition metal (TM).

7. The method of claim 6 wherein the TM is selected from the group consisting of chromium (Cr), zinc (Zn), aluminium (Al) and copper (Cu)

8. The method of claim 7 wherein the transition metal-substituted cobalt ferrite has a general formula $CoFe_{2-x}TM_xO_4$ wherein TM is selected from the group consisting of Cr, Mn, Zn, Al, Cu, and any mixtures thereof and x is about 0 to about 1.0.

9. The method of claim 7 wherein the transition metal-substituted cobalt ferrite has a general formula $Co_{1-y}TM_yFe_2O_4$ where TM is selected from the group consisting of Cr, Mn, Zn, Al, Cu, and any mixtures thereof and y is about 0 to about 0.95.

10. The method of claim 1 further comprising the step of adding a metallic binder to the mixed powder prior to the step of remilling the mixed powder.

11. The method of claim 10 wherein the step of adding a metallic binder includes the step of adding Ni powder and Ag powder wherein the Ag powder comprises a larger volume fraction of the metallic binder and the Ni powder comprise a least volume fraction of the metallic binder.

12. The method of claim 1 further comprising the step of adding an organic binder to the mixed powder after the step of remilling the mixed powder thereby forming an organically bound powder and wherein the steps of mixing the mixed powder and pressing the mixed powder into a desired shape and sintering the mixed powder at a temperature in the range of approximately 1000°C to 1350°C for a period of time ranging from about 2 to about 24 hours in air comprises the steps of mixing the organic bound powder and pressing the organically bound powder into a desired shape and sintering the organic bound powder at approximately 1350°C for 24 hours in air and cooling down the sintered organically bound powder by one of cooling the sintered organic bound powder inside a furnace at a controlled cooling rate in the range of about 4°C per hour to about 850°C per hour and by removing the sintered organic bound powder from the furnace to room temperature air.

13. The method of claim 12 further comprising the step of heating the organically bound powder at about 500°C for about 5 hours to allow the organic binder to burn out.

14. The method of claim 2 wherein the manganese-substituted cobalt ferrite has a reduction in Curie temperature of up to about 300 degree Celsius.